fortunately thrown overboard with some rubbish from the ship laboratory.

The exact measurements of the specimen will be given later when the photograph is reproduced by the Fish Commission.

THEO. GILL,
C. H. TOWNSEND.

CURRENT NOTES ON METEOROLOGY.

HAIL PREVENTION BY CANNONADING.

THE hail prevention cannonading craze has gone very far in Windisch-Feistritz (Steiermark), the home of this newest undertaking for artificially controlling weather phenomena. In *Das Wetter* for October Dr. Friedrich Stengel, who has recently visited the locality, gives an enthusiastic account of the somewhat remarkable arrangements which have been made for this work. The huts containing the firing apparatus are 1 km. apart, in four long parallel rows, the rows also being 1 km. apart. There are three groups of stations, containing twelve, thirteen and fifteen stations each, respectively. Each section has a central station, under the charge of a *schiessmeister*, and each *schiessmeister* is directed by the general superintendent. Cannonading begins when a thunder-storm is within two or three kilometers. Sometimes only one of the sections fires; at other times all the stations participate. Firing continues until the sky begins to clear overhead, or, if this does not happen, until thunder and lightning cease and a general rain sets in. The central station of each section regulates the time of the beginning and ending of the firing, as well as the rapidity of the discharges.

THE DUST STORM OF MARCH, 1901, AND GLACIAL STUDIES.

IN the October number of the *Meteorologische Zeitschrift*, Richter calls attention to the use that may be made of the fall of red dust which occurred over most of Europe on March 11 last. It was suggested some time ago that studies of glacial movements and phenomena might be facilitated by coloring a considerable portion of the surface of a glacier, and then noting the rapidity of movement, and the folding and fracturing of this particular colored stratum. The dust storm of last March colored the European glaciers on a grand scale, and thus an excellent opportunity of making critical studies of these glaciers has been provided, which could never have been brought about by artificial means.

THE CLIMATIC CONTROL OF GOVERNMENT IN THE TROPICS.

MR. W. ALLEYNE IRELAND, who is well known in this country through his writings on the settlement and government of tropical possessions, read a paper on the influence of geographical environment on political evolution before the British Association at its Glasgow meeting. In this paper the possibilities of native government within the tropics are discussed. The conclusion is reached that while the natives of the tropics are not deficient in intellectual power, their 'climatic discipline' renders them unfitted to play the part of legislators or responsible administrators, or to maintain a government sufficiently stable to admit of proper commercial development.

UNDERGROUND TEMPERATURES AT OXFORD.

THE volume containing the meteorological observations made at the Radcliffe Observatory, Oxford, from 1892 to 1899, presents some notable facts regarding soil temperatures. The observations were made with platinum resistance thermometers, placed at various depths. The thermometers on the whole were found to work much more satisfactorily than the common spirit thermometers with long stems. It appears that the annual variation in temperature is reduced to 0.1° at a depth of 45.3 ft., and to 0.01° at 66 ft. The semi-annual wave has these same limits at 21.4 and at 36 ft., respectively.

R. DEC. WARD.

BOTANICAL NOTES.

IMPORTANT PHILIPPINE WOODS.

UNDER this title Captain George P. Ahern, of the Ninth Regiment of United States Infantry, has issued a small quarto volume of 112 pages, illustrated with forty-two colored plates. The author, who is in charge of the Forestry Bureau at Manila, candidly states that it is a compilation undertaken in response to numer-

ous inquiries concerning the Philippine forests. In its preparation he has made use of the works of Blanco, Vidal, Delgado and Garcia. The translations are rather awkward, indicating a lack of botanical knowledge on the part of the translator. The plates are mainly from Blanco's 'Flora de Filipinas' and Vidal's 'Sinopsis de Familias y Generos de Plantas lenosas de Filipinas.'

More than six hundred species of trees are now enumerated for the archipelago, and it is estimated that there are from twenty to forty millions of acres of forests still standing, in which there are in many places trees one hundred and fifty feet in height. Gum, rubber, gutta percha and dye-producing trees occur in abundance, as also those producing timber, firewood, textiles, oils, tan-bark, medicines and edible fruits.

In many cases these forests are at present inaccessible on account of the lack of waterways and good roads. The methods of the natives are crude, slow and expensive. When good roads are made and better methods are introduced the islands will be able to supply a large amount of timber for construction, for which there is a great demand throughout the Orient.

RECENT ECOLOGICAL PAPERS.

THREE recent papers are noted here, the first of which is by Professor Doctor Bray of the University of Texas, on the 'Ecological Relations of the Vegetation of Western Texas,' published in the August, September and October numbers of the *Botanical Gazette*, in which the author points out the fact that the region is the meeting ground of no less than eight floral elements, and that the flora is one of xerophytic aspect. Excellent half-tone illustrations add much to the clearness of the text. The second paper is by A. J. Pieters, assistant botanist in the United States Department of Agriculture, on 'The Plants of Western Lake Erie,' in the *Bulletin* of the United States Fish Commission. Here it is shown that the vegetation may be grouped as follows: (1) Free-swimming, microscopic forms in the open lake—*i. e.*, the plankton; (2) other unattached species, mainly macroscopic, as *Lemna utricularia*, etc.; (3) attached submersed plants, as *Naias*, *Chara*, *Cladophora*, etc.; (4) attached plants with floating leaves, as *Nymphæaceæ* and *Potamogeton;* (5) swamp plants. Here again excellent half-tone illustrations are used with good effect. The third paper is by Thomas H. Kearney, of the Division of Botany of the United States Department of Agriculture, on a botanical survey of that very interesting region, the Dismal Swamp of southeastern Virginia. After a discussion of such factors as climate, physiography, geology and soils, the plant covering is described at length, and the conclusion is reached that of the indigenous species (about 620) 'over five hundred are endemic in extra-tropical North America, the great majority in the country east of the Rocky Mountains.'

GOVERNMENT GRASS STUDIES.

THE Division of Agrostology was established in the United States Department of Agriculture in 1895 for the purpose of investigating the various problems relating to the grasses and forage plants of the country. After six years of existence a bulletin has been issued presenting a summary of the work accomplished, under the title of 'Field Work of the Division of Agrostology,' and prepared by Cornelius L. Shear. Maps show at a glance the territory covered by the various field workers, and no botanist can examine these without gratification that so much has been done in half a dozen years. The greatest amount of work has been done in the Gulf States from Florida to Texas, thence northward over the Great Plains and the eastern Rocky Mountain region to the international boundary. Twenty-seven different botanists have been engaged in these field studies.

In the Atlantic coast states the investigations included, in addition to the usual one of forage, the study of grasses as sand-binders, and much attention was given to this part of the subject. In the States of the Gulf coast the forage problems are more difficult of solution, the soil having been exhausted in many places, and the people having the impression that grasses for forage purposes cannot be grown here as well as in the North. The fact that between 300 and 400 species grow naturally in this region disproves the latter, and the results of experiments show

that on almost any soil some grasses may be grown with profit. On the Great Plains, although the region is so vast, the problems are less varied, since the conditions are more nearly similar throughout. Here to a great extent the problem is the preservation of the natural pastures and meadows, and their renovation where they have been injured by overpasturing or by the plow. Over a great part of this region the natural meadows should be allowed to remain, and the plow should not be permitted to disturb the well-set sod. In the Rocky Mountains the conditions are extremely varied, and the problems are accordingly more numerous. In many places the natural meadows must be preserved, while in others, as under irrigation, grasses especially suited to the new conditions must replace the scanty growth which preceded them. A new problem obtrudes itself here, viz., that of forage plants for the 'alkali soils.' The problems in the Northwest include the last mentioned (apparently solved by the growth of species of *Atriplex*), and the renovation of the natural pastures which have been overstocked. In the Southwest some interesting facts are brought to light, as that as soon as the prairie fires are stopped the mesquite tree (*Prosopis*) and the prickly pear cactus (*Opuntia*) increase very rapidly, while at the same time the extermination of the coyotes allows the rabbits and prairie dogs to increase to such a degree as to make them most serious pests. On the Pacific coast the work has included the problem of the control of shifting sands in addition to studies of pasture and meadow grasses.

In the course of these investigations much valuable material for scientific study has been obtained, and great quantities of seeds of the more important species have been secured for distribution and trial elsewhere in the country. Above forty bulletins have been issued by the division, ranging from quite popular to technically scientific. No one can look over the work done, as indicated in this bulletin, and not feel that Secretary Morton did a good thing when he established the Division of Agrostology, and that it has fully justified its existence.

Charles E. Bessey.

The University of Nebraska.

THE SOUTH AFRICAN MUSEUM.

The report of the South African Museum for 1900 may be styled a record of good work performed under adverse conditions, for the war in South Africa has affected the museum in more ways than one, lessening not only the number of contributors to the collections, but the number of visitors. This falling off is the first break in a steady increase that has been going on for a considerable period. The accessions of vertebrates have been principally of birds, but one example of the young of the rare cat *Felis nigripes* was obtained in a rather curious way, it having run into the trenches at Zand River during a hot engagement.

Two of the contributors to the museum, Mr. Walter Francis and Dr. A. C. Stark, have been killed during the war; the latter was engaged in the preparation of a work on the birds of South Africa, the first volume of which had appeared. The second volume has been completed by the director, Dr. W. L. Sclater, and is now in press. Dr. L. Peringuey has sent to the printer the first part of a descriptive catalogue of the *Scarabeidæ*, and states that the manuscript of the second part is well advanced. The second volume of the *Annals* of the museum is well along and all the collections are said to be in good shape, and we hope with Sir David Gill that the time may soon come when it will be possible to increase the small appropriation made for the maintenance of this museum.

F. A. L.

SCIENTIFIC NOTES AND NEWS.

Director W. W. Campbell, of the Lick Observatory, was elected a foreign associate of the Royal Astronomical Society at the meeting of November 9.

Mr. Alexander Agassiz, accompanied by Mr. W. McM. Woodworth, has undertaken an expedition to the Maldive Islands in the Indian Ocean, in order to study the coral formations. A steamboat for this purpose has been chartered at Ceylon.

Professor F. Lamson Scribner, chief of the Division of Agrostology of the United States Department of Agriculture, has been given charge of the Bureau of Agriculture which is to